AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Original) A multi-user detector processing system for multiple access communications channels, comprising:

   a multi-user detector coupled to a plurality of user signals, wherein said multi-user detector produces a first set of symbol estimates for each of said user signals;

   a first bank of decoders coupled to said symbol estimates producing a first decoded data stream; and

   a second bank of decoders coupled to said first bank of decoders processing said first decoded data stream and producing a second decoded data stream, wherein said second decoded data stream is passed back to said first bank of decoders for processing of a third decoded data stream, wherein said third decoded data stream is passed back to said multi-user detector for processing of a second set of symbol estimates for each of said user signals, and wherein said second set of symbol estimates is passed to said first bank of decoders to produce a fourth decoded data stream said fourth decoded data stream is passed to said second bank of decoders to produce a fifth decoded data stream.

2. (Original) The multi-user detector processing system according to Claim 1, wherein said multi-user detector uses algorithms selected from at least one of the group consisting of: M-algorithm, T-algorithm, MT algorithm, Q-algorithm, and FANO algorithm.

3. (Original) The multi-user detector processing system according to Claim 1, wherein said first bank of decoders are convolutional decoders and said second bank of decoders are block decoders.

4. (Original) The multi-user detector processing system according to Claim 1, wherein said first bank of decoders are convolutional decoders and said second bank of decoders are convolutional decoders.

5. (Original) The multi-user detector processing system according to Claim 1, wherein said first bank of decoders are block decoders and said second bank of decoders are block decoders.

6. (Currently Amended) The multi-user detector processing system according to Claim 1, wherein said convolutional decoders are [[is]] selected from at least one of the group consisting of: maximum a posteriori (MAP) decoders, soft-output Viterbi algorithm (SOVA) decoders, and Bahl, Cocke, Jelinek, Raviv (BCJR) decoders.

7. (Original) The multi-user detector processing system according to Claim 1, further comprising an interleaver and a de-interleaver coupled between said multi-user detector, said first bank of decoders and said second bank of decoders.

8. (Currently Amended) The multi-user detector processing system according to Claim 1, further comprising a hard decision unit coupled to said ~~low complexity~~ second bank of decoders processing said ~~soft~~ fifth decoded data stream producing a final data stream for each of said user signals.

9. (Original) The multi-user detector processing system according to Claim 1, further comprising a filter unit coupled to said user signals and said multi-user detector.

10. (Currently Amended) The multi-user detector processing system according to Claim 9, wherein said filter unit is selected from the group comprising: [[a]] whitening matched filter bank and [[a]] matched filter bank.

11. (Original) The multi-user detector processing system according to Claim 1, further comprising iterative processing of said fifth decoded data stream by said first bank of decoders, said multi-user detector and said second bank of decoders until a final condition is obtained.

12. (Original) The multi-user detector processing system according to Claim 11, wherein said fifth decoded data stream is output data.

13 (Currently Amended) The multi-user detector processing system according to Claim 11, wherein said final condition is selected from the group consisting of: [[an]] allowable performance level and [[a]] fixed number of iterations.

14. (Original) A method for processing receiver signals from multiple users, said method comprising:

estimating a set of symbols from said receiver signals for each of said users using a multi-user detector;

decoding said set of symbols using a first decoder and producing a set of corrected first decoder values;

decoding said first decoder values with a second decoder and producing a set of corrected second decoder values;

decoding said set of corrected second decoder values using said first decoder and producing a set of re-corrected first decoder values;

re-estimating said set of symbols using said multi-user detector;

re-decoding said set of symbols using said first decoder and revising said set of corrected first decoder values; and

re-decoding said first decoder values with said second decoder and revising said set of second decoder values.

15. (Original) The method for processing receiver signals according to claim 14, further comprising repeating said steps of re-estimating using said multi-user detector, re-decoding using said first decoder and re-decoding using said second decoder until a final state is obtained and outputting a final data stream for each user.

16. (Currently Amended) The method for processing receiver signals according to claim [[14]] 15, wherein said final state is determined by setting a fixed number of iterations.

17. (Currently Amended) The method for processing receiver signals according to claim [[14]] 15, wherein said final state is determined by setting an allowable performance level.

18. (Original) The method for processing receiver signals according to claim 14, further comprising performing parameter estimation of said receiver signals.

19. (Original) The method for processing receiver signals according to claim 14, further comprising de-interleaving and interleaving.

20. (Original) The method for processing receiver signals according to claim 14, further comprising filtering said receiver signals.

21. (Original) The method for processing receiver signals according to claim 14, further comprising decoding said corrected second decoder values with a third decoder and producing a set of corrected third decoder values; decoding said set of corrected third decoder values using said second decoder and revising said set of corrected second decoder values.

22. (Original) A Turbo Multi-User detector for processing a plurality of received signals, comprising:

a parameter estimation unit coupled to said received signals;

a multi-user detector coupled to said parameter estimation unit, wherein said multi-user detector provides a plurality of information streams, one stream corresponding to each of said received signals;

a bank of convolutional decoders coupled to said plurality of information streams, wherein said convolutional decoders output a plurality of refined information streams; and

a bank of block decoders coupled to said plurality of refined information streams, wherein said block decoders output a plurality of refined-improved information streams, said plurality of refined-improved information streams fed back to said bank of convolutional decoders output a plurality of further refined-improved information streams which is fed back to said multi-user detector.

23. (Original) The Turbo Multi-User detector according to claim 22, further comprising an iterative processing between said multi-user detector, said bank of convolutional decoders and said bank of block decoders until a final condition is reached and said bank of block decoders output a final plurality of symbol streams.

AMENDMENTS TO THE DRAWINGS

The attached annotated sheet showing changes to drawings, sheet 6/7, includes changes to Fig. 6a and 6b. This sheet, which includes Fig. 6a and 6b, replaces the original sheet 6/7, which included Fig. 6a and 6b. Also attached is a replacement sheet 6/7 with the changes incorporated. No new matter has been added

In Fig. 6a, "Step 1/Step 6" has been changed to "Step 1/Step 5" and "Step 2/Step 5" has been changed to "Step 2/Step 6". This figure is similar to figure 3b and figure 6b which properly denote the steps in the processing although the decoders are changed.

In Fig. 6b, boxes surrounding optional interleaver **335** and de-interleaver **315** have been enlarged.